Claims

1. Use of a composition comprising a sponge toxin for the reversible formation of a membrane pore.

2. Use according to claim 1, wherein the sponge toxin comprises at least one polymeric 1,3-alkylpyridinium salt (poly-APS).

3. Use according to either claim 1 or claim 2 wherein the sponge toxin is obtained from the sponge *Reniera sarai, Callyspongia ridleyi, Haliclona erina, Haliclona rubens, Haliclona viridis, Amphimedon viridis, Callyspongia fibrosa and Amphimedon compressa*.

4. Use according to any preceding claim, wherein the sponge toxin has a molecular weight of between 5 kDa and 20 kDa.

5. Use according to claim 4, wherein the sponge toxin has a molecular weight of 5.5 kDa or 18.9 kDa.

6. Use according to any preceding claim, wherein the concentration of sponge toxin is between 0.5 ng/ml and 5.0 µg/ml.

7. Use according to claim 6 wherein the concentration of sponge toxin is between 0.5 ng/ml and 0.5 µg/ml.

8. A method for the reversible formation of membrane pores, the method comprising the steps of:-

a) incubating the membrane in the presence of a composition according to any preceding claim; and

b) removing the composition from contact with the membrane.

9. A method according to claims 8, wherein zinc solution is added to attenuate the formation of the membrane pore.

10. A method according to claim 9 wherein the concentration of zinc solution is between substantially 1 to 2 mM.

11. A method according to claim 9 or 10, wherein the concentration of zinc is 1.5mM.

12. A method for transfection of a macromolecule into a cell *in vitro*, the method comprising the steps of:-

a) incubating the cell in the presence of a composition comprising a sponge toxin;

b) removing the composition from contact with the membrane; and

c) adding the macromolecule.

13. A method according to claim 12, wherein the macromolecule is cDNA, protein, peptide, lipid or oligonucleotide.

14. A method according to claim 12 or 13, wherein the cell is incubated in the presence of the composition for between 1 and 20 minutes prior to addition of the macromolecule.

15. A method according to any one of claim 12 to 14 wherein the cell is incubated in the presence of the

composition for 5 minutes prior to the addition of the macromolecule.

16. A method according to any of claims 13 to 15, wherein between 1.0 and 5.0 µg nucleic acid is added.

17. A method according to any of claims 13 to 16, wherein 2.5 µg nucleic acid is added.

18. A method according to any of claims 12 to 17, comprising incubating the cell, in the presence of the composition and macromolecule and replacing the composition and macromolecule with standard media.

19. A method according to claim 18 wherein the cells are incubated for between 20 and 200 minutes.

20. A method according to either claim 18 or 19 wherein the cells are incubated for 180 minutes.

21. A method for transfection of a macromolecule into a cell *in vivo*, the method comprising the step of:-

a) incubating the cell in the presence of a composition comprising a sponge toxin and the macromolecule.

22. A method according to claim 21, wherein the macromolecule is cDNA, protein, peptide, lipid or oligonucleotide.

23. A method according to claim 21 or 22, wherein the macromolecule is the cytoskeletal protein tau.

24. A method according to any of claims 21 to 23 wherein

the cell is a hippocampal neurone.

25. A model for use in the study of neurological disease or treatments thereof, the model comprising a rodent having undergone application of a composition comprising a sponge toxin, tau protein and phosphatase inhibitor to the hippocampus.

26. A model according to claim 25 wherein the neurological disease is Alzheimer's.

27. A model according to claims 25 or 26 wherein the rodent is a rat or a mouse.

28. A method of studying a neurological disease, the method comprising:

a) applying a composition comprising a sponge toxin, tau protein and phosphatase inhibitor to the hippocampus of a rodent; and

b) studying the effect on the rodent.

29. A model according to claims 25 to 27 or a method according to claim 28 wherein the phosphatase inhibitor is okadaic acid.